CLAIMS:

1. A communications system, comprising:

a satellite located in space over the earth and including an antenna disposed thereon, said antenna having means for communicating radio frequency (RF) energy along a beam in a plurality of cells over a predetermined region of the earth, said cells having a predetermined shape with a predetermined boundary and an assigned set of communication slots, each communication slot being assignable to a selected ground user terminal within each cell;

means associated with said antenna for dynamically modifying said cell boundary in a pre-selected cell in accordance with a predetermined criteria including user service demand in adjacent cells, said pre-selected cell boundary being modified to overlap an area of said adjacent cells; and

means within said user terminal for communicating RF energy with said antenna in said communication slots.

2. A communications system as recited in claim **1**, wherein said means for communicating RF energy along said beam comprises transmitting RF energy from said satellite to said user terminal.

3. A communications system as recited in claim **1**, wherein said means for communicating RF energy along said beam comprises receiving RF energy from said user terminal at said satellite.

4. A communications system as recited in claim **1**, wherein said antenna is selected from the group consisting of a phased-array antenna and a multi-beam antenna.

5. A communications system as recited in claim **1**, wherein said communication slot is a portion of a frequency range.

6. A communications system as recited in claim **1**, wherein said communication slot is a portion of a time segment.

7. A communication system as recited in claim **1**, wherein said means for dynamically modifying said cell boundary further comprises:

an uplink access communication channel allocated from said beam;

a downlink access communication channel allocated from said beam;

an access control function, said access control function having means for receiving access request data along said uplink access communication channel from said ground user terminal, means for transmitting a response to said ground user access request data to said ground user terminal station along said downlink access communication channel, and means for maintaining a database of available satellite communication resources based on said ground user access request data; and

an antenna processor located on said satellite, said antenna processor having means for receiving command data from said access control function, wherein said command data directs said antenna processor to command said antenna to modify a selected cell boundary based on said available satellite communication resources.

8. A communication system as recited in claim 7, wherein said uplink access communication channel further comprises means for allowing random access from a plurality of said user terminals.

9. A communication system as recited in claim 7, wherein said access control function is located in said antenna processor.

10. A communication system as recited in claim 7, wherein said access control function is located at a ground station control center.

11. A method for communicating comprising:

operating a satellite including an antenna in space over the earth;

communicating radio frequency (RF) energy through said antenna along a beam in a plurality of cells over a predetermined region of the earth, said cells having a predetermined shape with a predetermined boundary and an assignable set of communication slots;

assigning each said communication slot to a selected ground user terminal within each cell;

dynamically modifying said cell boundary in a pre-selected cell in accordance with a predetermined criteria including user service demand in adjacent cells, said pre-selected cell boundary being modified to overlap an area of said adjacent cells; and

communicating RF energy between said antenna and said user terminal in said communication slots.

12. The method as recited in claim **11**, wherein communicating radio frequency (RF) energy through said antenna further comprises transmitting RF energy from said satellite to said user terminal along said beam in said communication slots, said communication slots comprising downlink slots.

13. The method as recited in claim **11**, wherein communicating radio frequency (RF) energy through said antenna further comprises receiving RF energy from said user terminal at said satellite along said beam in said communication slots, said communication slots comprising uplink slots.

14. The method as recited in claim **11**, wherein operating said satellite further comprises selecting said antenna from the group consisting of phased-array antenna and multi-beam antenna.

15. The method as recited in claim **11**, wherein dynamically modifying said cell boundary further comprises:

allocating an uplink access communication channel from said beam;

allocating a downlink access communication channel from said beam;

receiving at an access control function, access request data along said uplink access communication channel from said ground user terminal;

transmitting a response to said ground user access request data from said access control function to said ground user terminal station along said downlink access communication channel;

maintaining, at said access control function, a database of available satellite communication resources based on said ground user access request data; and

sending command data from said access control function to an antenna processor located on said satellite, including said antenna processor commanding said antenna to modify a selected cell boundary based on said available satellite communication resources.